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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

DATE: JAN 12 1993

SUBJECT: Preliminary Comments on the Preliminary Remedial Design Report for Medley Farm Site, Cherokee County, South Carolina

TO: Ralph Howard, Remedial Project Manager
North Superfund Management Section

FROM: Jennifer Herndon, Hydrogeologist
Ground Water Technology Support Unit

THROUGH: David W. Hill, Chief
Ground Water Technology Support Unit

As requested, the Preliminary Remedial Design Report for the Medley Farm Site has been reviewed. Also, the technical memo from RMT concerning third quarter sampling data was reviewed. The following comments are labeled according to the document to which they refer.

Preliminary Remedial Design Report

According to the Prelimary Remedial Design Report, the site geology consists of residual soil which averages 0 to 11 feet thick, saprolite which averages 50 to 70 feet thick near the former disposal areas, and bedrock below that depth. The bedrock consists of a transition zone which averages 15 feet thick. A problem exists in applying analytical and numerical models to the site, because the depth of the aquifer is unknown. It is proposed in the document, that aquifer tests will be conducted at the site to determine representative hydraulic properties and aquifer thickness. It should be noted that the value for aquifer thickness must be interpreted based on lithologic descriptions of the stratigraphy. Aquifer test data will not indicate aquifer thickness. This value should be a known value that is applied to the appropriate analytical model.

It is proposed in the document (Appendix A) that two aquifer tests will be conducted prior to installing the extraction wells. Information obtained from the tests will be used to determine appropriate locations for the extraction wells. The wells to be tested are SW-108 and SW-4. Both of these wells pentrate the saprolite but the extraction wells will penetrate

the saprolite and bedrock. It is recommended that an aquifer test be conducted in the bedrock as well as the saprolite, before any extraction wells are installed. Aquifer test data in conjunction with a flow model will provide necessary data for designing an effective extraction system (i.e., hydraulic conductivity and storage values, heterogeneity, and anisotropy of the bedrock, and leakage values between the bedrock and saprolite.)

A potential bedrock well that could be tested is BW-105. During the test, surrounding bedrock wells should be monitored, i.e., BW-111, BW-2, BW-112, BW-109, BW-108, BW-202, and BW-201. Data from these wells may indicate preferential flow direction due to joints and fractures in the bedrock. Aquifer test results may indicate the degree of fracturing between the pumping well and the monitoring wells. This information will aid in selecting appropriate locations for extraction wells. If possible ground water in the bedrock should be pumped at the optimal pumping rate for a minimal duration of 48 hours. This length of time is necessary to determine boundary effects in the unconfined aquifer. The recovery period should be monitored at least 24 hours. Information obtained from the test is pertinent input data for Modflow.

It is recommended that when the aquifer tests are conducted in the saprolite, nearby wells that penetrate the same zone should be monitored. For example, when pumping SW-108, wells SW-102, SW-201, and SW-3 be should be monitored. Similarly, when pumping SW-4, wells SW-104, SW-109, and SW-3 should be monitored. Appendix A proposes that some of these wells will be monitored during the tests. However, any well that may be potentially impacted by drawdown during pumping should be monitored during the tests.

The text proposes that 8 extraction wells will capture the entire contaminant plume in 5 years. However, the capture zones generated and the times calculated are based on questionable slug test data, and the assumptions that the aquifer is homogeneous, isotropic, and ground water flows in one general direction. These parameters do not match the known parameters of the system flow, i.e., representative hydraulic properties of the aquifer are unknown, the aquifer is heterogeneous, anisotropic, and aquifer thickness is unknown. The results from the GPTRAC semi-analytical module can be used as a rough first estimate to aid in selecting optimal locations for extraction wells. However, aquifer test results and additional modelling efforts may indicate that additional extraction wells may be necessary to completely capture the plume within a reasonable time frame.

Page 3-18. The text states that the extraction wells will be screened from the bottom of the borehole to approximately five feet above the observed water table. Screening the well 5 feet

above the water table will cause the extraction well to be less efficient. The logic for this design should be explained.

Third quarter data

Based on the results of the third quarter data, the extent of the contaminant plume in the horizontal and vertical directions has not been fully defined. For example, BW-202 contained 27 ppb 1,2 DCA, 130 ppb PCE, and 62 ppb TCE; BW-201 contained 58 ppb PCE and 71 ppb TCE. The levels of chlorinated solvents at these locations are an order of magnitude greater than MCLs. It is necessary that an additional bedrock well be installed northeast of BW-201 and BW-202 to determine the extent of the contaminant plume in the down gradient direction.

Monitoring well BW-112 (240 feet deep) contained concentrations of chlorinated solvents above MCLs. The memorandum from RMT (12/15/92) indicates that the ground water quality results may be misleading because the possibility exists that contaminants migrated along the grout seal and well casing to the open hole interval. RMT contends that the BW-112 well was installed improperly and contaminants were introduced along the well casing, not through the saprolite and bedrock. RMT proposes to conduct packer tests to prove that contaminants are migrating along the well casing. Results from the packer tests may indicate which discrete intervals are contaminated along the open hole, but the packer test is not a definitive test for determining if contaminants are migrating solely along the well casing.

To determine if this zone has indeed been contaminated by chlorinated solvents migrating through overlying zones an additional deep bedrock well should be installed northeast or southeast of BW-112. The location of this well should be determined after the bedrock aquifer test is conducted. Aquifer test results may yield data that indicates preferential flow direction in the bedrock. This information can be used to select the optimal location for the deep bedrock monitoring well.

Hopefully these comments will be helpful in your review. If you have any questions or comments, please contact me at x3866.

cc: Beverly Houston